

CoCoALib - Bug #1749

Configuration hiccups on Mac M1

03 Jul 2023 14:51 - John Abbott

Status:	Closed	Start date:	03 Jul 2023
Priority:	High	Due date:	
Assignee:	John Abbott	% Done:	100%
Category:	Portability	Estimated time:	3.33 hours
Target version:	CoCoALib-0.99850	Spent time:	3.30 hours
Description			
Max Horn reported by email several configuration/compilation hiccups on Mac M1 platform. Investigate & fix.			
Related issues:			
Related to CoCoALib - Feature #1748: July 2023		New	30 Jun 2023

History

#1 - 03 Jul 2023 14:52 - John Abbott

I was trying to compile CoCoA from source. I downloaded CoCoALib-0.99818 sources from your website.

Unfortunately I failed to compile it. For reference, this is on an M1 mac running macOS 12.6.7. GMP is installed via homebrew. I had to point the configure script at it, but then it died with this error:

```
$ ./configure --with-libgmp=/opt/homebrew/lib/libgmp.dylib
```

```
-----  
Starting configuration process for CoCoALib, CoCoA-5 (without Qt-GUI)  
-----
```

Using GMP version 6.2.1:

```
header is /opt/homebrew/include/gmp.h  
library is /opt/homebrew/lib/libgmp.dylib
```

```
./configure: ERROR: Supplied value of CXXFLAGS, namely " -std=c++14 -Wall -pedantic -fPIC -O2"  
./configure: ERROR: is not compatible with GMP library  
ERROR: failed to compile/link test-gmp-cxxflags --> see LogFile. [[gmp-check-cxxflags.sh]]
```

It claims that the C++ compiler flags are not compatible with GMP, but that seems odd, the flags are pretty normal? I would debug further, but unfortunately I could not find the "LogFile" it mentions.

Well, I dug a bit deeper; seems you put the logfile into a temp directory, but without telling users where it is, that is not so helpful... I added some printing to "gmp-check-cxxflags.sh" to find the LogFile content afterwards:

```
g++ -std=c++14 -Wall -pedantic -fPIC -O2 test-gmp-cxxflags.c -o test-gmp-cxxflags -I"/Users/mhorn/Downloads/CoCoALib-0.99818/configuration/ExternalLibs/include" -L"/Users/mhorn/Downloads/CoCoALib-0.99818/configuration/ExternalLibs/lib" -lgmp  
clang: warning: treating 'c' input as 'c++' when in C++ mode, this behavior is deprecated [-Wdeprecated]  
ld: library not found for -lgmp  
clang: error: linker command failed with exit code 1 (use -v to see invocation)
```

So the problem seems to be this: you specify -lgmp but then the -L flag points out a dir you created, with a hierarchy of symlinks:

```
$ tree configuration/ExternalLibs  
configuration/ExternalLibs  
├── include  
│   └── gmp.h -> /opt/homebrew/include/gmp.h  
└── lib  
    └── libgmp-symlink.dylib -> /opt/homebrew/lib/libgmp.dylib
```

So the library there has the name "libgmp-symlink" instead of "libgmp", so instead of -lgmp one would need -lgmp-symlink...

After hacking around this, I got a new error:

ERROR: unexpected extn in /opt/homebrew/lib/libgmp.dylib

So it seems your build system just is not able to deal with shared libraries on macOS? OK, let's try a

Eventually this got me past the configure script:

```
./configure --with-libgmp=/opt/homebrew/lib/libgmp.a --with-boost-hdr-dir=/opt/homebrew/include
```

Doing make shows a tons of warnings

```
ld: warning: -no_pie is deprecated when targeting new OS versions
ld: warning: -no_pie ignored for arm64
```

Unfortunately the test suite then fails:

```
~/Downloads/CoCoALib-0.99818 (git:main+) $ make
=====
Compiling CoCoALib-0.99818
  CXX = g++
  CXXFLAGS = -std=c++14 -Wall -pedantic -fPIC -O2
  CXXFLAGS_DEFINES =
=====
Compiling CoCoALib source subdirectory AlgebraicCore/
-----
[CoCoALib already compiled]

Compiling CoCoALib source subdirectory AlgebraicCore/
-----
[CoCoALib already compiled]

Compiling and running all CoCoALib tests
-----

Running the CoCoALib tests (120-CoCoALib tests altogether)
-----
[1/120-CoCoALib] test-empty..... OK
[2/120-CoCoALib] test-BigInt1..... OK
[3/120-CoCoALib] test-BigInt2..... OK
[4/120-CoCoALib] test-BigInt3..... OK
[5/120-CoCoALib] ***** test-BigRat1 FAILED ***** (wrong output)
[6/120-CoCoALib] test-BigRat2..... OK
[7/120-CoCoALib] test-BigRat3..... OK
[8/120-CoCoALib] test-BigRat4..... OK
[9/120-CoCoALib] test-bool3..... OK
[10/120-CoCoALib] ***** test-exbugs FAILED ***** (wrong output)
[11/120-CoCoALib] test-combinatorics1..... OK
[12/120-CoCoALib] test-convert1..... OK
[13/120-CoCoALib] test-cyclotomic..... OK
[14/120-CoCoALib] ***** test-DenseUPolyRing1 FAILED ***** (wrong output)
[15/120-CoCoALib] test-DynamicBitset1..... OK
[16/120-CoCoALib] test-factor1..... OK
[17/120-CoCoALib] test-FloatApprox1..... OK
[18/120-CoCoALib] test-FractionField1..... OK
[19/120-CoCoALib] test-FreeModule1..... OK
[20/120-CoCoALib] ***** test-FreeModule2 FAILED ***** (wrong output)
[21/120-CoCoALib] test-frobby1..... OK
[22/120-CoCoALib] ***** test-GMPAllocator FAILED ***** (wrong output)
[23/120-CoCoALib] ***** test-GOperations1 FAILED ***** (wrong output)
[24/120-CoCoALib] test-GOperations2..... OK
[25/120-CoCoALib] ***** test-GReductor1 FAILED ***** (wrong output)
[26/120-CoCoALib] test-Graeffe..... OK
[27/120-CoCoALib] test-gs11..... OK
[28/120-CoCoALib] test-hilbert1..... OK
[29/120-CoCoALib] test-HomomorphismOps1..... OK
[30/120-CoCoALib] test-ideal1..... OK
[31/120-CoCoALib] test-ideal2..... OK
[32/120-CoCoALib] test-IdealOfPoints1..... OK
[33/120-CoCoALib] test-IntOperations1..... OK
[34/120-CoCoALib] test-IntOperations2..... OK
[35/120-CoCoALib] test-IntOperations3..... OK
[36/120-CoCoALib] ***** test-IsInteger1 FAILED ***** (wrong output)
[37/120-CoCoALib] test-LRSDegeneracy1..... OK
[38/120-CoCoALib] test-LRSDegeneracy2..... OK
[39/120-CoCoALib] test-MachineInt1..... OK
[40/120-CoCoALib] test-MachineInt2..... OK
```

```

[41/120-CoCoALib] test-matrix1..... OK
[42/120-CoCoALib] ***** test-matrix2 FAILED ***** (wrong output)
[43/120-CoCoALib] test-matrix3..... OK
[44/120-CoCoALib] test-matrix4..... OK
[45/120-CoCoALib] test-MatrixForOrdering1..... OK
[46/120-CoCoALib] ***** test-MatrixForOrdering2 FAILED ***** (wrong output)
[47/120-CoCoALib] test-MatrixSpecial1..... OK
[48/120-CoCoALib] test-MatrixSpecial2..... OK
[49/120-CoCoALib] test-MatrixOps1..... OK
[50/120-CoCoALib] test-MinPoly1..... OK
[51/120-CoCoALib] test-MinPoly2..... OK
[52/120-CoCoALib] test-module1..... OK
[53/120-CoCoALib] test-MonomialIdeal1..... OK
[54/120-CoCoALib] test-GFan1..... OK
[55/120-CoCoALib] test-normaliz1..... OK
[56/120-CoCoALib] test-normaliz2..... OK
[57/120-CoCoALib] ***** test-NumTheory1 FAILED ***** (wrong output)
[58/120-CoCoALib] test-NumTheory2..... OK
[59/120-CoCoALib] ***** test-NumTheory3 FAILED ***** (wrong output)
[60/120-CoCoALib] test-NumTheory4..... OK
[61/120-CoCoALib] test-NumTheory5..... OK
[62/120-CoCoALib] ***** test-obsolete FAILED ***** (wrong output)
[63/120-CoCoALib] ***** test-OpenMath1 FAILED ***** (wrong output)
[64/120-CoCoALib] test-OrderedDomain1..... OK
[65/120-CoCoALib] test-OrderedDomain2..... OK
[66/120-CoCoALib] ***** test-output FAILED ***** (wrong output)
[67/120-CoCoALib] ***** test-PPMonoid1 FAILED ***** (wrong output)
[68/120-CoCoALib] ***** test-PPMonoid2 FAILED ***** (wrong output)
[69/120-CoCoALib] ***** test-PPMonoidSparse1 FAILED ***** (wrong output)
[70/120-CoCoALib] test-PPMonoidHom1..... OK
[71/120-CoCoALib] test-PPVector..... OK
[72/120-CoCoALib] test-QuotientRing1..... OK
[73/120-CoCoALib] ***** test-QBGenerator1 FAILED ***** (wrong output)
[74/120-CoCoALib] test-RadicalMembership1..... OK
[75/120-CoCoALib] test-RandomSource1..... OK
[76/120-CoCoALib] test-RandomSource2..... OK
[77/120-CoCoALib] test-RandomSource3..... OK
[78/120-CoCoALib] ***** test-RandomLong1 FAILED ***** (wrong output)
[79/120-CoCoALib] ***** test-RandomBigInt1 FAILED ***** (wrong output)
[80/120-CoCoALib] test-RingAssign1..... OK
[81/120-CoCoALib] test-RingElem1..... OK
[82/120-CoCoALib] test-RingElem2..... OK
[83/120-CoCoALib] test-RingElem3..... OK
[84/120-CoCoALib] test-RingElem4..... OK
[85/120-CoCoALib] test-RingElem5..... OK
[86/120-CoCoALib] test-RingElem6..... OK
[87/120-CoCoALib] test-RingFp1..... OK
[88/120-CoCoALib] test-RingFq1..... OK
[89/120-CoCoALib] ***** test-RingHom1 FAILED ***** (wrong output)
[90/120-CoCoALib] ***** test-RingHom2 FAILED ***** (wrong output)
[91/120-CoCoALib] ***** test-RingHom3 FAILED ***** (wrong output)
[92/120-CoCoALib] test-RingHom4..... OK
[93/120-CoCoALib] test-RingQQ1..... OK
[94/120-CoCoALib] test-RingTwinFloat1..... OK
[95/120-CoCoALib] test-RingTwinFloat2..... OK
[96/120-CoCoALib] test-RingTwinFloat3..... OK
[97/120-CoCoALib] test-RingTwinFloat4..... OK
[98/120-CoCoALib] test-RingTwinFloat5..... OK
[99/120-CoCoALib] test-RingWeyl1..... OK
[100/120-CoCoALib] test-RingZZ1..... OK
[101/120-CoCoALib] test-RingZZ2..... OK
[102/120-CoCoALib] test-RingZZmodN1..... OK
[103/120-CoCoALib] test-RootBound1..... OK
[104/120-CoCoALib] test-RootBound2..... OK
[105/120-CoCoALib] test-SmallFp1..... OK
[106/120-CoCoALib] test-SmallFp2..... OK
[107/120-CoCoALib] ***** test-SparsePolyRing1 FAILED ***** (wrong output)
[108/120-CoCoALib] ***** test-SparsePolyRing2 FAILED ***** (wrong output)
[109/120-CoCoALib] test-SqFreeFactor1..... OK
[110/120-CoCoALib] test-SturmSeq1..... OK
[111/120-CoCoALib] test-symbol1..... OK
[112/120-CoCoALib] test-symbol2..... OK
[113/120-CoCoALib] test-toric1..... OK
[114/120-CoCoALib] ***** test-TmpIsTree FAILED ***** (wrong output)
[115/120-CoCoALib] test-TmpMorseElement..... OK

```

```
[116/120-CoCoALib] test-TmpMorsePath..... OK
[117/120-CoCoALib] test-TmpMorseGraph..... OK
[118/120-CoCoALib] test-TmpResolutionMinimization..... OK
[119/120-CoCoALib] test-utils1..... OK
[120/120-CoCoALib] test-utils2..... OK
*****
**** Bad news ****
*****
**** The following CoCoALib tests failed, please tell us about it.
**** test-BigRat1 test-exbugs test-DenseUPolyRing1 test-FreeModule2 test-GMPAllocator test-GOperations1 tes
t-GReductor1 test-IsInteger1 test-matrix2 test-MatrixForOrdering2 test-NumTheory1 test-NumTheory3 test-obsoles
cent test-OpenMath1 test-output test-PPMonoid1 test-PPMonoid2 test-PPMonoidSparse1 test-QBGenerator1 test-Rand
omLong1 test-RandomBigInt1 test-RingHom1 test-RingHom2 test-RingHom3 test-SparsePolyRing1 test-SparsePolyRing2
test-TmpIsTree
make[3]: *** [check] Error 1
make[2]: *** [check] Error 2
make[1]: *** [check] Error 2
make: *** [default] Error 2
```

#2 - 19 Jan 2024 17:35 - John Abbott

- Priority changed from Normal to High

#3 - 28 Feb 2024 19:59 - John Abbott

I'm hoping to sort this out soon... ideally by tomorrow (ha ha!). It seems I've forgotten username/password (sigh). Hope to resolve it tomorrow. Maybe the error mesgs from Max Horn are already enough to make some improvements?

#4 - 28 Feb 2024 20:36 - John Abbott

- Status changed from New to In Progress

- Assignee set to John Abbott

- % Done changed from 0 to 10

I have now changed all messages in the checking scripts so that they specify the full path when referring to LogFile, and in some cases I added a reference to the LogFile.

I have also revised configure so that the suffix for libgmp is (hopefully) correctly handled: it expects one of **.a** or **.so** or **.dylib** or **.dll.a** (weird Microsoft name?)

Uff! Now I suppose I must check the changes (sigh)

I'm puzzled by the wrong output errors in some of the tests. Not sure how to fix this with trying it myself.

#5 - 28 Feb 2024 21:32 - John Abbott

Aha! The examples with wrong output are **all examples** which are expected to produce output.

There are two likely causes:

- the output of the execution is written into the wrong place/file
- the comparison of the output with the expected output incorrectly reports a problem (maybe weird newlines?)

#6 - 29 Feb 2024 15:33 - John Abbott

- Status changed from *In Progress* to *Resolved*

- % Done changed from 10 to 70

CoCoALib now seems to compile without too many hiccups... Will check in shortly.
Not yet tried CoCoA-5

#7 - 08 Mar 2024 09:41 - John Abbott

- Related to Feature #1748: July 2023 added

#8 - 08 Mar 2024 17:08 - John Abbott

- Status changed from *Resolved* to *Feedback*

- % Done changed from 70 to 90

Verified that CoCoA-5 also build OK on Mac M1.
--> feedback

#9 - 16 Mar 2024 21:54 - John Abbott

Failed to verify on Anna's old intel MacBook: compiler gave an error about ptrdiff_t in some system header (sigh)
[probably xcode is not correctly installed]

#10 - 21 Mar 2024 20:31 - John Abbott

- Status changed from *Feedback* to *Closed*

- % Done changed from 90 to 100

- Estimated time set to 3.33 h